

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system, the method comprising:

growing a crystal of a III-V compound of the nitride system having a predetermined thickness on a surface of a basal body[[,]];

wherein the growth step comprises:

forming a first III-V nitride pattern plurality of nitride patterns of at least one pitch, in one position in the crystal in a direction of a thickness of the crystal, the first pattern including a plurality of first elements distributed in a lateral direction with respect to the crystal at a pitch, each of the first elements forming an elongate stripe extending in a longitudinal direction that is substantially orthogonal to said lateral direction and each of the first elements having at least one width measured in the lateral direction; and

forming a second III-V nitride pattern plurality of nitride patterns of at least one pitch, in another position in the crystal in the direction of the thickness of the crystal, the second pattern including a plurality of second elements distributed in the lateral direction with respect to the crystal at a pitch, each of the second elements forming an elongate stripe extending in the longitudinal direction and each of the second elements having at least one width measured in the lateral direction;

wherein the pitch of said first pattern elements of said first plurality of patterns and the pitch of said second pattern elements of said second plurality of patterns are different; and

wherein the second plurality of patterns pattern partly overlies and partly does not overlie said first plurality of patterns pattern in the direction of the thickness of the crystal due at least in part to the different pitches of the first pattern and the second pattern.

2. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 1, ~~wherein each of the first and second plurality of patterns takes form in pattern elements arranged in one direction in a plane almost parallel to the surface of the basal body~~

wherein the width measured in the lateral direction of at least one of said first pattern elements and the width measured in the lateral direction of at least one of said second pattern elements are different; and

wherein the second pattern partly overlies and partly does not overlie said first pattern in the direction of the thickness of the crystal due at least in part to said different widths.

3. (Canceled)

4. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 2 1,

wherein a relationship between the pitch of the first pattern elements of ~~one of the first plurality of patterns~~ and the pitch of the second pattern elements of ~~one of the second plurality of patterns~~ is:

$$0.1 \mu\text{m} < p_1 \times p_2 / |p_2 - p_1| < 5000 \mu\text{m}$$

where p_1 denotes the pitch of the first pattern elements of ~~one of the first plurality of patterns~~ and p_2 denotes the pitch of the second pattern elements of ~~one of the second plurality of patterns~~.

5. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 2 1,

wherein at least one of the first and second ~~plurality of patterns~~ has pattern elements arranged in a plurality of different pitches measured in the lateral direction with respect to the crystal.

6. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 2 1, ~~wherein at least one of the first and second plurality of patterns has pattern elements arranged at a plurality of different intervals and has pattern elements of a plurality of different widths in the direction of the arrangement of the pattern elements~~

wherein the second pattern has at least three different pitches measured in a lateral direction with respect to the crystal.

7. (Canceled)

8. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system ~~as claimed in claim 1~~, comprising:

growing a crystal of a III-V compound of the nitride system having a predetermined thickness on a surface of a basal body,

wherein the growth step comprises:

forming a first pattern including a plurality of first pattern elements in a first position in the crystal in the direction of the thickness of the crystal, the first pattern elements being distributed in a lateral direction with respect to the crystal and in a longitudinal direction with respect to the crystal that is substantially orthogonal to the lateral direction so that a space separates each set of adjacent first pattern elements of the plurality of first pattern elements in the lateral direction and in the longitudinal direction, the first pattern having a lateral pitch measured in the lateral direction and a longitudinal pitch measured in the longitudinal direction that is substantially the same as the lateral pitch; and

forming a second pattern in a second position in the crystal in the direction of the thickness of the crystal including a plurality of longitudinal pattern elements extending in the longitudinal direction and a plurality of lateral pattern elements extending in the lateral direction to intersect the longitudinal pattern elements, the intersecting elements forming a plurality of spaces between them that are aligned in the lateral direction and in the longitudinal direction, the plurality of longitudinal elements having a pitch measured in the lateral direction and the plurality of lateral elements having a pitch measured in the longitudinal direction that is substantially the same as the lateral pitch;

wherein the pitches of the first pattern are different from the pitches of the second pattern;

wherein the second pattern partly overlies and partly does not overlie the first pattern in the direction of the thickness of the crystal due at least in part to the different pitches; and

wherein each of the first and second ~~plurality of patterns takes form in~~
~~pattern elements~~ is arranged in two directions in a respective plane and each plane is
substantially almost parallel to the surface of the basal body.

9. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 8,

wherein each of said first pattern elements and each of said spaces
formed by the elements of the second pattern is shaped as a rhombus having no interior
right angles ~~there is a region where the second plurality of patterns overlies the first~~
~~plurality of patterns in the direction of the thickness of the crystal and a region where the~~
~~second plurality of patterns does not overlie the first plurality of patterns in the direction~~
~~of the thickness of the crystal and both regions coexist in one direction of the two~~
~~directions.~~

10. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 8,

wherein each of said first pattern elements and each of said spaces
formed by the elements of the second pattern has a shape selected from a group of
shapes consisting of parallelogram, hexagon, and triangle ~~there is a region where the~~
~~second plurality of patterns overlies the first plurality of patterns in the direction of the~~
~~thickness of the crystal and a region where the second plurality of patterns does not~~
~~overlie the first plurality of patterns in the direction of the thickness of the crystal and~~
~~both regions coexist in both of the two directions.~~

11. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 1,

wherein the growth step further comprises:

a first pattern formation step in which the first ~~plurality of patterns~~ pattern
is formed one of directly on the basal body and on the basal body with a base layer in
between;

a first growth step in which an intermediate layer as part of the crystal is deposited on one of the surface of the basal body and on a surface of the base layer with the first ~~plurality of patterns~~ pattern formed thereon;

a second pattern formation step in which the second ~~plurality of patterns~~ pattern is formed on a surface of the intermediate layer deposited in the first growth step; and

a second growth step in which a top layer as part of the crystal is deposited on the surface of the intermediate layer with the second ~~plurality of patterns~~ pattern formed thereon.

12. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,

wherein at least one of the first ~~plurality of patterns~~ pattern and the second ~~plurality of patterns~~ pattern is comprised of a masking material.

13. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 12,

wherein the masking material includes silicon (Si) and at least one selected from the group consisting of oxygen (O) and nitrogen (N).

14. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,

wherein the basal body comprises one of sapphire (Al_2O_3), silicon (Si), silicon carbide (SiC), gallium arsenide (GaAs), magnesium aluminum composite oxide (MgAl_2O_4), lithium gallium composite dioxide (LiGaO_2) and gallium nitride (GaN).

15. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,

wherein the base layer is deposited by growing a III-V compound of the nitride system on the basal body.

16. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 15,
wherein the first pattern formation step comprises:
forming the first ~~plurality of patterns~~ pattern by deposition of a masking material on the surface of the base layer,
and the growth step further comprises:
between the first pattern formation step and the first growth step,
a step of selectively etching the base layer using the first ~~plurality of patterns~~ pattern as a mask.

17. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 15,
wherein the second pattern formation step comprises:
forming the second ~~plurality of patterns~~ pattern by deposition of a masking material on the intermediate layer deposited in the first growth step,
and the growth step further comprises:
between the second pattern formation step and the second growth step,
a step of selectively etching the intermediate layer using the second ~~plurality of patterns~~ pattern as a mask; and
a step of removing the masking material of the second ~~plurality of patterns~~ pattern.

18. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,
wherein the first pattern formation step comprises:
forming the first ~~plurality of patterns~~ pattern by forming an indentation in one of the surface of the basal body and in the surface of the base layer.

19. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,
wherein the second pattern formation step comprises:

forming the second ~~plurality of patterns~~ pattern by forming an indentation in the surface of the intermediate layer deposited in the first growth step.

20. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11, further comprising:
separating at least the basal body from the crystal.

21. (Canceled)

22. (Canceled)

23. (Currently amended) A method of manufacturing a device by forming a device film on a surface of one of a crystal substrate and a crystal film, the method comprising:

forming one of the crystal substrate and the crystal film ~~in a growth step~~ by growing a crystal of a III-V compound of a nitride system having a thickness on a surface of a basal body; and

forming ~~[[a]]~~ the device film on one of the crystal substrate and the crystal film ~~in a device film step, the device film having a light-emitting portion including a cladding layer having a protrusion, a contact layer formed on the cladding layer only above the protrusion, and an electrode formed on the contact layer,~~

wherein the growth step comprises:

forming a first pattern including a plurality of nitride patterns of first elements distributed in a lateral direction with respect to the crystal in at least one pitch, the first pattern being formed in one position in the crystal in a direction of the thickness of the crystal, each of the first elements having at least one width measured in the lateral direction; and

forming a second pattern including a plurality of nitride patterns of second elements distributed in the lateral direction in at least one pitch, the second pattern being formed in another position in the crystal in the direction of the thickness of the crystal, each of the second elements having at least one width measured in the lateral direction;

~~wherein the pitch of pattern elements of said first plurality of patterns and the pitch of pattern elements of said second plurality of patterns are different; and~~

~~wherein the first plurality of patterns second pattern partly overlies and partly does not overlie the second plurality of patterns first pattern in the direction of the thickness of the crystal due at least in part to the different pitches; and~~

~~wherein said light-emitting portion overlies a region of the crystal where the second pattern overlies the first pattern so that dislocations that may form in the crystal adjacent the basal body generally do not reach said light-emitting portion.~~

24. (Currently amended) A method of manufacturing a device as claimed in claim 23 ~~further comprising: separating the basal body from one of the crystal substrate and from the crystal film wherein,~~

the second pattern partly overlies and partly does not overlie the first pattern in the direction of the thickness of the crystal due at least in part to a variance between the pitch of the first pattern and the pitch of the second pattern and/or a variance between the width measured in the lateral direction of at least one of said first pattern elements and the width measured in the lateral direction of at least one of said second pattern elements.

25. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system, the method comprising:

growing a crystal of a III-V compound of the nitride system having a predetermined thickness on a surface of a basal body,

wherein the growth step comprises:

forming a first ~~pattern plurality of nitride patterns of at least one pitch,~~ in one position in the crystal in a direction of a thickness of the crystal, the first pattern including a plurality of first elements distributed in a lateral direction with respect to the crystal at a pitch, each of the first elements forming an elongate stripe extending in a longitudinal direction that is substantially orthogonal to said lateral direction and each of the first elements having at least one width measured in the lateral direction; and

forming a second ~~pattern plurality of nitride patterns of at least one pitch,~~ in another position in the crystal in the direction of the thickness of the crystal, the

second pattern including a plurality of second elements distributed in the lateral direction with respect to the crystal at a pitch, each of the second elements forming an elongate stripe extending in the longitudinal direction and each of the second elements having at least one width measured in the lateral direction;

~~wherein the pitch of pattern elements of the first and second plurality of patterns are different; and~~

~~wherein each of said first and said second plurality of patterns take form in pattern elements and at least one pattern element of said second plurality of patterns overlies a pattern element of said first plurality of patterns in the direction of the thickness of the crystal and at least one pattern element of said second plurality of patterns does not overlie a pattern element of said first plurality of patterns in the direction of the thickness of the crystal, the coexisting overlying and non-overlying characteristics being due at least in part to the different pitches~~

wherein the width measured in the lateral direction of at least one of said first pattern elements is different than the width measured in the lateral direction of at least one of said second pattern elements; and

wherein said second pattern partly overlies and partly does not overlie said first pattern in the direction of the thickness of the crystal due at least in part to the different widths.

26. (Canceled)

27. (New) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 8, wherein forming said first pattern includes forming the first pattern including a III-V nitride and/or forming said second pattern includes forming the second pattern including a III-V nitride.

28. (New) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 23, wherein forming said first pattern includes forming the first pattern including a III-V nitride and/or forming said second pattern includes forming the second pattern including a III-V nitride.